

CLAIMS

We claim:

- 5 1. A system of remotely distributed devices connectable together over a network,  
said system comprising:  
a distribution hub;  
one or more connectable devices connected to said distribution hub;  
a test initiator accessible from at least one of said connected remotely connectable  
10 devices; and  
a testing unit that tests the operation of the one remote device in response to  
initiation from said test initiation unit.
- 15 2. A system as in claim 1, the testing unit comprising:  
means for identifying one of said one or more remotely connected devices as  
being associated with an initiating connection test initiator; and  
means for pinging said identified one remotely connected device.
- 20 3. A system as in claim 2, wherein the testing unit further comprises:  
means for determining whether said identified one remotely connected device has  
previously registered with said network.
- 25 4. A system as in claim 1, wherein at least one of said remotely connected devices,  
is a cable modem connected to a distribution hub.
5. A system where as in claim 4, said test initiator includes a button on said cable  
modem for being actuated to initiate a test of said cable modem's connection to said  
distribution hub and to said network.
- 30 6. A system as in claim 4, wherein said test initiator is a virtual button on a website.
7. A system as in claim 4, wherein said test initiator is a virtual button on a computer  
display.

8. A system as in claim 1 further comprising:  
an automatic response system providing initiating users with connection test results.

5

9. A system as in claim 8, wherein the automatic response system comprises a voice response system dialing initiating users and providing a vocal report of test results.

10. A system as in claim 8, wherein the automatic response system comprises an e-mail server automatically sending e-mail test reports to initiating users.

11. A method of automatically testing and diagnosing problems associated with each of a plurality of remotely connected devices on a network of said remotely connected devices, each of said remotely connected devices being uniquely identifiable, at least one of said remotely connected devices being capable of initiating a service request, said method comprising the steps of:

- a) identifying one remotely connected device as being associated with a service check request, a requesting user making said service check request;
- b) pinging said identified remotely connected device;
- 20 c) examining system logs to determine if an error is indicated for said one remotely connected device; and
- d) reporting service check results to said requesting user using said one remotely connected device.

25 12. A method as in claim 11, wherein said identified one remotely connected device is a cable modem and, the step (a) of identifying the one remotely connected device comprises the steps of:

- i) identifying a cable modem machine access code (MAC) address from a subscriber database;
- 30 ii) identifying a cable modem Internet protocol (IP) address from a Dynamic Host Configuration Protocol (DHCP) server reservation; and
- iii) determining a Cable Modem Terminal System (CMTS) from the said cable modem IP address.

13. A method as in claim 12 wherein, if it is determined in step (b) that the cable modem associated with the requesting user is pingable, then, a determination is made whether the cable modem is registered on the CMTS.

5

14. A method as in claim 13, wherein if it is determined that the cable modem is registered on the CMTS, then, the requesting user's personal computer (PC) networking configuration is checked.

10 15. A method as in claim 11 wherein, if in step (b) it is determined that the requesting user's cable modem is not pingable, the method further comprising the step of:

b1) determining if the CMTS contains an entry corresponding to the requesting user's cable modem MAC address in a status table.

15 16. A method as in claim 15 wherein, if the cable modem MAC address is not found in the status table, the requesting user is directed to physically check the cable modem for an indication of connection to the network.

20 17. A method as in claim 11, wherein the step (c) of examining logs to determine if an error is indicated comprises the steps of:

- i) checking a trap log for registration failure;
- ii) checking said DHCP Server determine if it is functioning;
- iii) checking said TFTP Server to determine if it is working; and
- iv) checking for the cable modem's DHCP Discover in the DHCP log.

25

18. A method as in claim 17 wherein, if the step (c) (i), if the trap log shows a registration failure, said registration failure is reported in step (d).

30 19. A method as in claim 17 wherein, if the step (c) (ii) it is determined that the DHCP Server is not working, a DHCP Server failure is reported in step (d).

20. A method as in claim 17 wherein, if the in step (c) (iii) the TFTP Server is not working, then, a TFTP Server failure is reported in step (d).

21. A method as in claim 17 wherein, if in step (c) (iv) the cable modem's DHCP Discover is not found, then, the method further comprises the steps of:
  - checking the CMTS log for a DHCP Discover,
  - 5 reporting an invalid DHCP helper address condition when the DHCP Discover is found in the CMTS log, and otherwise
  - indicating that the cable modem did not provide a DHCP Discover.
22. A method as in claim 20 wherein, if in step (c) (iv) the cable modem's DHCP Discover is found in the DHCP log, the method further comprising the steps of:
  - checking the TFTP Server for a logged request, and
  - checking the cable modem config file when a logged request is found in TFTP Server and, otherwise
  - 15 checking the CMTS to TFTP IP routing.
23. A servicing system for testing networked devices, the servicing system comprising:
  - a servicing station remote from devices to be tested with the devices being linked to the station;
  - 20 predetermined diagnostic testing implemented on the devices;
  - a testing initiation signal generated by a user for having the predetermined diagnostic testing automatically performed on one of the devices associated with the user without requiring the user to be subject to interrogations by personnel at the servicing station; and
  - 25 a predetermined responsive communication mode through which the user receives information regarding results of the automated testing from the service station in a manner preselected by the user.
24. The servicing system of claim 23 wherein the devices are cable modems and the predetermined diagnostic testing includes software of the modems configured to undertake the testing.

25. The servicing system of claim 23 including a contact database maintained by the servicing station for correlating user contact information and an identifier for the device associated with the user.

5 26. The servicing system of claim 25 wherein the devices are cable modems and the identifier is an IP address.

27. The servicing system of claim 23 wherein the testing initiation signal is a flag, said flag causing said one device to send a self-test request code to said servicing station.

10

28. The servicing system of claim 27 wherein the devices are cable modems and said cable modems entering self-test mode responsive to said flag.

15 29. The servicing system of claim 28 wherein responsive to said self test code from one of said cable modems, said servicing station pings said one cable modem with multiple packet sizes.

20 30. The servicing system of claim 23 wherein the predetermined diagnostic testing is a hierarchy of tests selected based on predetermined problems that have a high occurrence probability when diagnostic testing is deemed necessary.